

AVID and the Common Core State Standards in Math

Shared Philosophy

The AVID Mission Statement addresses goals that are well-aligned with the Common Core State Standards (CCSS). Both AVID and CCSS focus on providing students with “key cognitive strategies and skills that students need for college and careers,” as David Conley (2011) wrote in his article entitled “Building on the Common Core,” published in the March edition of *Educational Leadership*. Both also emphasize development and refinement of student competence in Writing, Inquiry, Collaboration, Organization, and Reading (WICOR), the key components of curriculum in the AVID world, and naturally lead to professional development in the teaching of reading, writing, speaking, and listening, so that teachers have the opportunity to add to their cognitive toolkits in order to teach literacy skills effectively as they implement rigorous, higher-level thinking activities that help students address the challenges of expository reading and writing tasks. The mission statements of AVID and CCSS reflect this shared philosophy.

Common Core State Standards Mission Statement (www.corestandards.org)

The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

AVID Mission Statement (www.avid.org)

AVID’s mission is to close the achievement gap by preparing all students for college readiness and success in a global society.

Side-by-Side Comparison of CCSS and AVID

Common Core State Standards (CCSS) (www.corestandards.org)	Advancement Via Individual Determination (AVID) (www.avid.org)
Are aligned with college and work expectations	Is focused on preparing students to become college- and career-ready
Are clear, understandable, and consistent	Is based on a clear set of 11 Essentials
Include rigorous content and application of knowledge through high-order skills	Provides rigor in the classroom through higher-level thinking activities
Build upon strengths and lessons of current state standards	Supports the implementation of all state standards in all content areas
Are informed by other top-performing countries, so that all students are prepared to succeed in our global economy and society	Prepares all students for college readiness and success in a global society
Are evidence-based	Is based on more than 30 years of data

AVID Curriculum Materials and the Common Core State Standards 6-12

The AVID curriculum materials continue to be written, rewritten, revised, and refined every year, so that they reflect current trends in education and address educational standards across the country. Because the Common Core State Standards also address the importance of Reading, Writing, Speaking and Listening, and Language in curricula across the country, the AVID curriculum materials support the standards in many and various ways. The tables below provide a clear picture of how the curriculum texts available to every teacher at an AVID school support the Common Core State Standards. Below is a list of the AVID curriculum texts used to produce the comparison tables below.

- *The Write Path: Math 1*
- *The Write Path Math 2*

*** Tutorials occur twice weekly in all AVID Elective classes, and the AVID tutorial process and protocol are based on the materials published in the *AVID Tutorial Support Curriculum Resource Guide* and related ancillary materials. While this text is not specifically mentioned among the materials in the comparison tables, it is important to understand that students incorporate many of the materials and strategies that are mentioned in the tables into the tutorials, and many of the same materials are therefore integrated into the tutorial manual.

Common Core: Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.

Standards for Mathematical Practice	AVID Curriculum
<p>1. Make sense of problems and persevere in solving them.</p> <p>Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondence between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes 1.2 Practicing Cornell Notes 1.3 Learning Logs 1.4 Let me think – Reflective Journal 1.5 Quickwriting 1.7 Crossing the River 1.8 Technical Writing 2.2 Philosophical Chairs 2.3 Socratic Seminar 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 3.5 Four Color Activity 4.7 Sentence Frames <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes 1.3 Nonlinguistic Representations 1.6 The “Dominant Hand” Exploration 1.7 Three Column Proofs 1.8 Test Corrections 2.3 Test Preparation: Why, Why, Why, Why? 2.4 Inquiry Cube 2.5 Philosophical Chairs- Investigation of Cone Volume 2.6 On Demand Socratic Seminar 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 3.4 Complicating Equations 3.5 Four Color Functions

	<p>3.6 Investigating Area under a Curve</p> <p>3.7 Deriving the Quadratic Equation</p> <p>4.2 Highlighting and Annotating a Math Text</p> <p>4.3 Reading Comprehension – Looking for Clues</p> <p>4.4 The Whole Picture</p> <p>4.5 Advanced Sentence Frames</p> <p>4.6 Academic Language – Looking for Multiple Meanings</p>
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2. Reason abstractly and quantitatively.

Common Core Curriculum Standards	AVID Curriculum
<p>2. Reason abstractly and quantitatively</p> <p>Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to <i>decontextualize</i>—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to <i>contextualize</i>, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.5 Quickwrite 1.7 Crossing the River 2.2 Philosophical Chairs 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 3.4 Algebra Aerobics 4.7 Sentence Frames 4.9 I Have – Who Has <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.2 Non Linguistic Representations 1.7 Three Column Proofs 2.3 Test Preparation: Why, Why, Why, Why? 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 3.3 Algebra Charades 3.4 Complicating Equations 3.6 Investigating Area under a Curve 3.7 Deriving the Quadratic Equation 4.4 The Whole Picture 4.5 Advanced Sentence Frames 4.6 Academic Language – Looking for Multiple Meanings

3. Construct viable arguments and critique the reasoning of others

Common Core Curriculum Standards	AVID Curriculum
<p>3. Construct viable arguments and critique the reasoning of others</p> <p>Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose.</p> <p>Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.4 Let me think – Reflective Journal 1.5 Quickwrite 1.7 Crossing the River 1.9 Collaborative Drafting 2.1 Costa’s Level of Thinking 2.2 Philosophical Chairs 2.3 Socratic Seminar 2.4 Mathematical Symbols 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 3.4 Algebra Aerobics 3.5 Four Color Activity 4.1 General Reading 4.2 Text Structures 4.3 KWL 4.4 Concept Definition Map 4.5 PQ5R 4.6 Jigsaw 4.7 Sentence Frames 4.8 Think Aloud 4.9 I Have – Who Has 4.10 Math Dictionary <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.3 Non Linguistic Representations 1.4 Writing Prompts – Five Ws 1.6 The “Dominant Hand” Exploration 1.7 Three Column Proofs 1.8 Test Corrections 2.1 The Evolution of a Great Question 2.2 Jigsaw Questions 2.3 Test Preparation: Why, Why, Why, Why?

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4. Model with Mathematics.

Common Core Curriculum Standards	AVID Curriculum
<p>4. Model with mathematics</p> <p>Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.7 Crossing the River 1.8 Technical Writing 2.1 Costa's Level of Thinking 2.2 Philosophical Chairs 2.3 Socratic Seminar 2.4 Mathematical Symbols 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 3.4 Algebra Aerobics 4.4 Concept Definition Map 4.5 PQ5R 4.7 Sentence Frames <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.3 Nonlinguistic Representation 1.4 Writing Prompts – Five Ws 1.6 The “Dominant Hand” Exploration 2.1 The Evolution of a Great Question 2.2 Jigsaw Questions 2.5 Philosophical Chairs- Investigation of Cone Volume 2.6 On Demand Socratic Seminar 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 3.3 Algebra Charades 3.6 Investigating Area under a Curve 4.5 Advanced Sentence Frames

5. Use appropriate tools strategically.

Common Core Curriculum Standards	AVID Curriculum
<p>5. Use appropriate tools strategically.</p> <p>Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.7 Crossing the River 1.8 Technical Writing 2.3 Socratic Seminar 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 4.7 Sentence Frames <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes – Power Notes 1.2 Math Bookmark 1.3 Nonlinguistic Representations 1.4 Test Corrections 2.5 Philosophical Chairs- Investigation of Cone Volume 2.6 On Demand Socratic Seminar 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 4.3 Reading Comprehension – Looking for Clues 4.4 The Whole Picture 4.5 Advanced Sentence Frames

6. Attend to precision.

Common Core Curriculum Standards	AVID Curriculum
<p>6. Attend to precision</p> <p>Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes 1.2 Practicing Cornell Notes 1.3 Learning Logs 1.4 Let me think – Reflective Journal 1.7 Crossing the River 1.8 Technical Writing 2.2 Philosophical Chairs 2.3 Socratic Seminar 2.4 Mathematic Symbols 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dickey Game of Numbers 3.4 Algebra Aerobics 3.5 Four Color Activity 4.1 General Reading 4.2 Text Structures 4.3 KWL 4.4 Concept Definition Map 4.5 PQ5R 4.6 Jigsaw 4.7 Sentence Frames 4.8 Think Aloud 4.9 I Have – Who Has 4.10 Math Dictionary <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes – Interactive Notebooks, Two Column Quiz 1.2 Math Bookmark 1.4 Writing Prompts – Five Ws 1.6 The “Dominant Hand” Exploration 1.7 Three Column Proofs 2.3 Test Preparation: Why, Why, Why, Why? 2.5 Philosophical Chairs- Investigation of Cone Volume

	<p>2.6 On Demand Socratic Seminar</p> <p>2.7 The Difference of Two Squares</p> <p>3.1 Math Tutorials</p> <p>3.2 Clustering</p> <p>3.3 Algebra Charades</p> <p>3.5 Four Color Functions</p> <p>3.6 Investigating Area under a Curve</p> <p>4.1 Test-Processing Strategies</p> <p>4.2 Highlighting and Annotating a Math Text</p> <p>4.4 The Whole Picture</p> <p>4.5 Advanced Sentence Frames</p>
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7. Look for and make use of structure.

Common Core Curriculum Standards	AVID Curriculum
<p>7. Look for and make use of structure</p> <p>Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.</p>	<p><i>The Write Path Math 1</i></p> <ul style="list-style-type: none"> 1.7 Crossing the River 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions 3.3 A Dicey Game of Numbers 3.5 Four Color Activity 4.7 Sentence Frames 4.9 I Have – Who Has <p><i>The Write Path Math 2</i></p> <ul style="list-style-type: none"> 1.1 Cornell Notes – Interactive Notebook 2.4 Inquiry Cube 2.5 Philosophical Chairs- Investigation of Cone Volume 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 3.4 Complicating Equations 3.5 Four Color Functions 3.6 Investigating Area under a Curve 3.7 Deriving the Quadratic Equation 4.4 The Whole Picture 4.5 Advanced Sentence Frames

8. Look for and express regularity in repeated reasoning.

Common Core Curriculum Standards	AVID Curriculum
<p>8. Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.</p>	<p><i>The Write Path Math 1</i> 1.7 Crossing the River 2.5 Geometric Spaghetti 3.1 Math Tutorials 3.2 Family of Functions</p> <p><i>The Write Path Math 2</i> 1.3 Nonlinguistic Representations – Signal Words to Identifying Patterns 2.4 Inquiry Cube 2.5 Philosophical Chairs- Investigation of Cone Volume 2.7 The Difference of Two Squares 2.8 Networks 3.1 Math Tutorials 3.6 Investigating Area under a Curve</p>